Giardiasis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To identify sources of major public health concern (e.g., a public water supply) and to stop transmission from such a source and prevent future recurrences.
2. To identify whether the case may be a source of infection for other persons (e.g., a diapered child or child care attendee), and, if so, to prevent further transmission.

B. Legal Reporting Requirements

1. Healthcare providers: notifiable to local health jurisdiction within 3 work days
2. Hospitals: notifiable to local health jurisdiction within 3 work days
3. Laboratories: no requirements for reporting
4. Local health jurisdictions: notifiable to Washington State Department of Health (DOH) Communicable Disease Epidemiology Section (CDES) within 7 days of case investigation completion or summary information required within 21 days

C. Local Health Jurisdiction Investigative Responsibilities

1. If a local health jurisdiction does not have adequate resources to investigate all cases of giardiasis, staff should focus investigations around the following:
   - Children $\leq$ 5 years old who attend child care settings; and
   - Individuals suspected to be part of an outbreak. If the number of reported cases in your jurisdiction is higher than usual for the time of year or for a particular demographic group, routine follow-up investigations should be conducted for all cases reported at least 2 weeks before the apparent increase.
2. Report all *confirmed* and *probable* cases (see definitions below) to CDES. Complete the giardiasis investigation form (http://www.doh.wa.gov/notify/forms/giardia.doc) and enter the data into the Public Health Issues Management System (PHIMS).

2. THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Giardia intestinalis (*G. lamblia, G. duodenalis*), a protozoan parasite. *Giardia* has two life cycle stages: cyst and trophozoite (free living stage). The relatively hardy cyst is the infectious form; it can remain viable in the environment for weeks or even months. After ingestion, cysts develop in the upper small intestine into trophozoites, which are the motile, feeding, reproducing, and symptom-causing form of the parasite. Infected persons shed trophozoites or cysts (or both) in stool, however, trophozoites do not survive in the environment. Cysts can be killed by boiling, filtration, or disinfection.

B. Description of Illness

Symptoms are variable, but typically include diarrhea, abdominal cramps, bloating, and

flatulence that may persist for weeks and can be intermittent or chronic. As the illness progresses and fat absorption is impaired, stools can develop a higher than usual fat content (steatorrhea). Symptoms may be more severe in persons who are immunocompromised (e.g., chemotherapy, untreated AIDS). Asymptomatic infections are common.

C. Giardiasis in Washington

During recent years, 400 to 700 cases of giardiasis have been reported to CDES annually. Common exposures reported by Washington residents include international travel and recreational water exposure.

D. Reservoirs

Humans and some animals are hosts for this parasite. Overall, humans are the most important source of other human infections. Many animals other than humans have been found to be infected, although the importance of most non-human reservoirs is unclear. Cattle, beaver, and other wildlife may be important in contaminating surface water supplies; domestic animals (e.g., dogs) may be a source for some human exposures.

E. Modes of Transmission

Transmission is fecal-oral. Examples include:

1. Contact with infected persons (i.e., those in the same household or child care);
2. Drinking fecally contaminated and inadequately treated water;
3. Ingesting fecally contaminated recreational water (rivers, lakes, etc.);
4. Eating food contaminated by animals or food handlers (rarely documented); and
5. Certain types of sexual contact (e.g., oral-anal contact).

F. Incubation Period

Variable, 3–25 days (or longer); median 7–10 days.

G. Period of Communicability

Persons are communicable as long as cysts are being shed, which may be many months; the typical shedding period is poorly defined and may be intermittent.

H. Treatment

Several medications are available to treat giardiasis including metronidazole, tinidazole, and nitazoxanide. In general, treatment of asymptomatic carriers is not recommended.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

An illness characterized by diarrhea, abdominal cramps, bloating, weight loss, or malabsorption. Infected persons may be asymptomatic.

B. Laboratory Criteria for Diagnosis

- Demonstration of *G. lamblia* cysts in stool, or

- Demonstration of *G. lamblia* trophozoites in stool, duodenal fluid, or small-bowel biopsy, or
- Demonstration of *G. lamblia* antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay)

C. Case Definition (1997)

Probable: a clinically compatible case that is epidemiologically linked to a confirmed case

Confirmed: a case that is laboratory confirmed

4. DIAGNOSIS AND LABORATORY SERVICES

A. Laboratory Diagnosis

The diagnosis of giardiasis is commonly made by the identification of trophozoites or cysts in stool specimens. The organism can either be directly visualized on routine ova and parasite (O&P) testing or visualized using a direct fluorescent antibody test. Enzyme immunoassays (EIA) are also commonly used to diagnose giardiasis.

B. Services Available at the Washington State Public Health Laboratories (PHL)

PHL identifies *Giardia* organisms in stool using a direct fluorescent antibody (DFA) test. Consult with Communicable Disease Epidemiology Section prior to submitting specimens.

C. Specimen Collection

To maximize the likelihood of detecting *Giardia*, three stool specimens should be collected 48 hours apart or over a 10-day period. Stool should be stored and transported either in Para Pac ULTRA ECOFIX™ or in one tube with 10% formalin and one tube with PVA. If the ECOFIX™ kit is being used, stool should be added to the collection kit until the fluid level reaches the red line marked on the outside of the tube. The kit should then be mixed and shipped at room temperature.

Specimens need to be shipped with a completed microbiology form (http://www.doh.wa.gov/EHSPHL/PHL/Forms/Microbiology.pdf).

5. ROUTINE CASE INVESTIGATION

The following section describes the routine case investigation for a person with giardiasis. If resources are limited, local health jurisdictions should focus investigations on the following:

- Children $\leq$ 5 years old who attend child care; and
- Individuals suspected to be part of an outbreak. If the number of reported cases in your jurisdiction is higher than usual for the time of year or for a particular demographic group, routine follow-up investigations should be conducted for all cases reported at least 2 weeks before the apparent increase.

A. Evaluate the Diagnosis

Review the clinical presentation and laboratory results.

B. Identify Potential Sources of Infection

Ask about possible exposures in the 3 to 25 days before onset, including:

1. Contact with any acquaintances or household member with a similar illness (anyone meeting the probable case definition should be reported and investigated in the same manner as a confirmed case);
2. Attendance or work at a child care facility by the case or a household member;
3. Source(s) of drinking water, including water at home and work, as well as streams, lakes or other untreated sources;
4. Recreational water exposures: lakes, rivers, swimming pools, water slides, etc.;
5. Travel outside the area;
6. Contact with livestock and other animals;
7. Other high-risk exposures as detailed in the routine questionnaire.

C. Identify Potentially Exposed Persons

Collect the name, age, and phone number of contacts with a similar illness. These people should be investigated as probable cases.

D. Environmental Evaluation

Conduct any appropriate environmental interventions such as child care inspections or evaluation of drinking water supplies.

6. CONTROLLING FURTHER SPREAD

A. Infection Control Recommendations / Case Management

1. Hospitalized patients should be cared for using standard precautions. In addition, contact precautions should be used for diapered or incontinent persons for the duration of illness or to control institutional outbreaks.
2. The case should be educated regarding modes of transmission and ways to prevent transmission to others. Cases should:
   a. Practice good personal hygiene, including effective hand washing, particularly after using the toilet, changing diapers, and before preparing or eating food. The importance of proper hygiene must be stressed, as excretion of the organism may persist for several weeks.
   b. Not enter public recreational water venues (e.g., pools, fountains, lakes) until 2 weeks after resolution of diarrhea.
   c. Avoid sexual practices that might result in oral exposure to stool (e.g., oral-anal contact).
   d. While symptomatic with diarrhea, avoid close contact with anyone who has a weakened immune system.
3. School Restrictions: Children should not attend school as long as they have diarrhea.
4. Work or Child Care Restrictions: Persons should not work as food handlers or child care

or health care workers, or attend child care as long as they have diarrhea. Restrictions can be waived or modified at the discretion of the local health jurisdiction.

5. If a suspected source of infection is identified and has the potential for transmitting infection to a defined population (e.g., contaminated well, infected animal), advise those individuals on measures to avoid exposure.

B. Contact Management

A symptomatic contact who meets the probable case definition should be investigated as a case.

C. Environmental Measures

An environmental evaluation is appropriate if an ongoing source of exposure is identified, such as a recreational water venue, drinking water system or child care facility.

7. MANAGING SPECIAL SITUATIONS

A. Case Attends or Works at a Child Care Facility

1. Exclude persons with giardiasis until the diarrhea has resolved.
2. If the center cares for diapered children, interview the operator and inspect attendance records to identify other possible cases among children or staff in the past three months.
3. If an outbreak is suspected, collect stool specimens for examination from all symptomatic staff members, attendees, and family members who have a diarrheal illness consistent with giardiasis.
4. Exclude all symptomatic persons from the child care until diarrhea resolves. Testing and exclusion of asymptomatic carriers, even in the setting of a child care outbreak, is generally not recommended.
5. Instruct the operator and staff about proper food handling and hand washing after diaper handling or bathroom use, and the importance of keeping diaper changing areas away from food preparation areas.
6. Instruct the operator regarding environmental sanitation, particularly in diaper changing areas.
7. Instruct the child care operator to call the local health jurisdiction immediately if new cases of diarrhea occur. The facility should be called or visited once each week for 6 weeks after onset of the last case to verify that surveillance and appropriate preventive measures are being carried out. Newly symptomatic children should be managed as outlined above.

8. ROUTINE PREVENTION

A. Immunization Recommendations: None

B. Prevention Recommendations (available at: http://www.cdc.gov/ncidod/dpd/parasites/giardiasis/factsht_giardia.htm)

1. **Practice good hygiene.**

a. Wash hands thoroughly with soap and water after using the toilet, before handling or eating food, after changing a diaper or assisting with toileting, after touching something that could be contaminated (such as a trash can, cleaning cloth, drain, or soil), and after handling animals or their toys, leashes, or feces.

b. Assist or visually supervise young children and other people you are caring for with hand washing as needed.

c. Shower with soap and water before entering recreational water. Wash thoroughly, especially rectal and genital areas, with soap and water, before entering swimming water, water parks, or other public bathing areas.

d. Keep *Giardia* and other germs out of pools, hot tubs, lakes, rivers, the ocean, etc. by taking the following steps:

- Protect others by not swimming if you are experiencing diarrhea and for 2 weeks after your diarrhea stops. This is essential for children in diapers.
- Take children on frequent bathroom breaks or check their diapers often.
- Change diapers in the bathroom or a diaper-changing area.

2. Avoid water that might be contaminated.

a. Do not drink untreated water from shallow wells, lakes, rivers, springs, ponds, and streams.

b. Do not drink untreated water or use ice made from untreated water during community-wide outbreaks of disease caused by contaminated drinking water.

c. Do not swallow recreational water. For more information on recreational water-related illness, visit CDC's Health Swimming website (http://www.cdc.gov/healthyswimming/).

d. Do not drink untreated water or use ice made from untreated drinking water in countries where the water supply might be unsafe. For information on traveler's health and giardiasis, visit Chapter 4 in CDC's Yellow Book.

e. Obtain recommendations on safe drinking water sources if severe flooding occurs. Shallow private well in flooded areas may need to be checked before use.

3. If you are unable to avoid using or drinking water that might be contaminated, then you can make the water safer to drink by doing one of the following:

a. Heat the water to a rolling boil for at least 1 minute (at altitudes greater than 6,562 feet [>2,000 meters], boil water for 3 minutes).
OR

b. Use a filter that has an absolute pore size of 1 micron or smaller, or one that has been NSF rated for "cyst removal." For information on choosing a water filter, see CDC's Fact Sheet A Guide to Water Filters.

c. If you cannot heat the water to a rolling boil or use a recommended filter, then try chemically treating the water by chlorination or iodination. Using chemicals may be less effective than boiling or filtering because the amount of chemical required to make the water safe is highly dependent on the temperature, pH, and cloudiness of the water.

4. **Avoid food that might be contaminated.**

   a. Use safe, uncontaminated water to wash all food that is to be eaten raw.

   b. Wash and/or peel all raw vegetables and fruits before eating.

   c. Avoid eating uncooked foods when traveling in countries with minimal water treatment and sanitation systems.

5. **Avoid fecal exposure during sexual activity. This is especially important while experiencing diarrhea caused by giardiasis.**

   a. Use a barrier during oral-anal sex.

   b. Wash hands immediately after handling a condom used during anal sex or after touching the anus or rectal area.

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UPDATES